



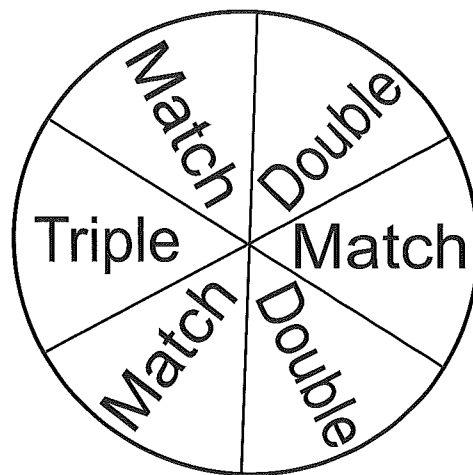
## Match the Donation

At the Crawford Middle School Fundraiser, an anonymous donor promised to match, double, or triple donations for the school's science lab based on the results of spinning a spinner.

- 1 What is the probability of spinning a "match"?  
Justify your answer.

- 2 What is the probability of spinning a "double"?  
Justify your answer.

- 3 What is the probability of spinning a "triple"?  
Justify your answer.



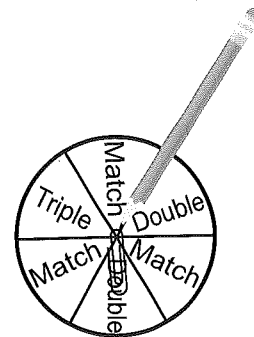
- 4 How many times would you expect to spin a "triple" if you spun the spinner 150 times?  
Justify your answer.

- 5 How many times would you expect to spin a "match" if you spun the spinner 150 times?  
Justify your answer.

- 6 Use a pencil and a paperclip to spin the spinner 20 times. Record the results of your spins in the table below:

Donation Matching

Result of Spin	Tally
Match	
Double	
Triple	





### Match the Donation

- 7 Based on the results recorded in your table, what is the probability of spinning a “match”?
  
  
  
  
  
  
  
  
  
  
- 8 Based on the results recorded in your table, what is the probability of spinning a “double”?
  
  
  
  
  
  
  
  
  
  
- 9 Based on the results recorded in your table, what is the probability of spinning a “triple”?
  
  
  
  
  
  
  
  
  
  
- 10 Based on the results recorded in your table, how many times might you expect to spin a “double” if you spin the spinner 150 times? Justify your answer.
  
  
  
  
  
  
  
  
  
  
- 11 Based on the results recorded in your table, how many times might you expect to spin a “match” if you spin the spinner 150 times? How does this compare to your answer to #5?
  
  
  
  
  
  
  
  
  
  
- 12 How do your experimental results compare to the probabilities you recorded for #1 – 3?



### Increasing the Donations

In order to increase interest in the fundraiser, the anonymous donor decided to give each person who made a donation a choice of spinning Spinner A or Spinner B to determine the matched amount.

Use Spinner A and Spinner B to answer the following:

- 1 If you were making a donation, which spinner would you choose? Why?
- 2 Which spinner offers a greater chance of spinning a “double”? Justify your answer.
- 3 If each spinner were spun 1 time, what would be the probability of spinning a “match” on Spinner A and a “triple” on Spinner B?
- 4 If Spinner B were spun 200 times, how many times would you expect it to land on “double”? Justify your answer.
- 5 Cut out Spinner A and cut each section of the spinner apart. Lay each section face down on your desk. Choose one section, do NOT replace it, then draw another section. Record the results of the 2 draws in the table below. Replace the 2 sections, shuffle all of the sections, and repeat this process 10 times.

Using Spinner A for 2 Draws

Result of 1 <sup>st</sup> Draw	Result of 2 <sup>nd</sup> Draw



### Increasing the Donations

Use Spinner A to answer the following questions:

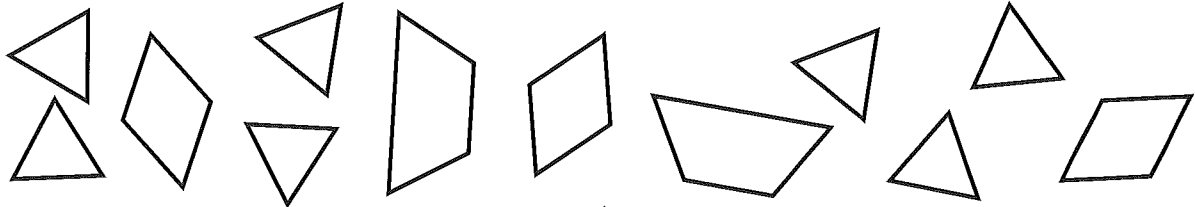
- 6 a) What is the theoretical probability of drawing a “triple,” not replacing it, and then drawing a “double”?
- b) How does this compare to your experimental results of drawing a “triple,” not replacing it, and then drawing a “double”?
- 7 a) What is the theoretical probability of drawing a “match,” not replacing it, and then drawing another “match”?
- b) How does this compare to your experimental results of drawing a “match,” not replacing it, and then drawing another “match”?
- 8 What is the theoretical probability of drawing a “triple,” not replacing it, and then drawing another “triple”? Justify your answer.
- 9 What is the theoretical probability of drawing a “match,” not replacing it, drawing a “double,” not replacing it, and then drawing another “match”? Justify your answer.
- 10 What is the theoretical probability of drawing a “match,” replacing it, drawing a “double,” not replacing it, and then drawing a “triple”?



## Independent Practice

The probability of 2 or more events occurring can be found by determining the product of the probabilities of each event. These events can be independent of each other or dependent upon each other.

The pattern blocks shown below are placed into a bag and randomly drawn 1 at a time.



### Independent Events

What is the probability of drawing a trapezoid, replacing it in the bag, and then drawing a rhombus?

a) Probability of drawing a trapezoid:  $\frac{2}{12} = \frac{1}{6}$

b) Since the trapezoid is replaced before drawing the rhombus, there are still 12 pattern blocks in the bag.

Probability of drawing a rhombus:  $\frac{3}{12} = \frac{1}{4}$

c) Probability of drawing a trapezoid and then a rhombus WITH replacement:

$$\frac{1}{6} \cdot \frac{1}{4} = \frac{1}{24}$$

### Dependent Events

What is the probability of drawing a trapezoid, NOT replacing it in the bag, and then drawing a rhombus?

a) Probability of drawing a trapezoid:  $\frac{2}{12} = \frac{1}{6}$

b) Since the trapezoid is NOT replaced before drawing the rhombus, there are now 11 pattern blocks in the bag.

Probability of drawing a rhombus:  $\frac{3}{11}$

c) Probability of drawing a trapezoid and then a rhombus WITHOUT replacement:

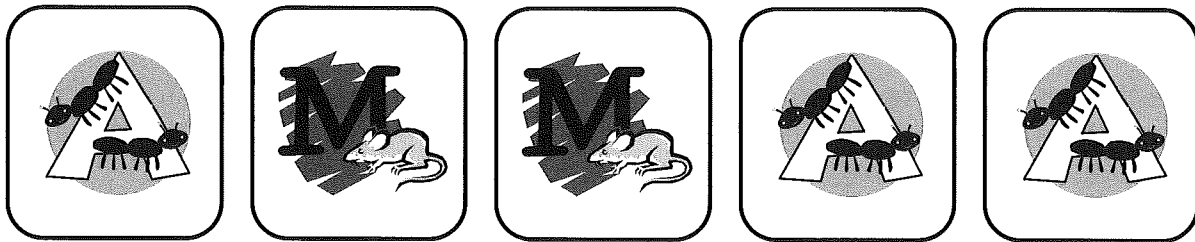
$$\frac{1}{6} \cdot \frac{3}{11} = \frac{1}{22}$$

- 1 A 6-sided fair number cube and a spinner are used in a game. The spinner has an equal chance of landing on 1 of 3 colors: red, yellow, and blue. The faces of the cube are labeled 1 through 6. What is the probability of spinning the color yellow and then rolling a 1 or a 2?
  
- 2 Greg practices basketball with his little sister, Amy, every afternoon. Greg charted Amy's free throws and calculated that the probability of Amy's successfully completing a free throw is 1 out of 10. About how many free throws would Amy make if she made 115 attempts?



## Unit 10 Lesson 1

- 3 a) A fair coin is tossed twice. What is the probability of its landing on heads both times?
- b) Julia tosses a fair coin twice and repeats this process for 50 trials. Out of her 50 trials, her coin landed on heads both times only 5 times. How does this experimental probability compare to the theoretical probability of tossing a coin twice and its landing on heads both times?
- c) If Julia continues her experiment for another 80 trials, how many more times can she expect the coin to land on heads both times, based on the results of her first 50 trials?
- 4 Musa and Ameena are playing with the alphabet cards shown below. The cards are placed face down on a table and then randomly drawn.



- a) What is the probability of choosing an "M," keeping it, and then choosing another "M"?
- b) What is the probability of choosing an "A," replacing it, and then choosing an "M"?
- c) What is the probability of choosing an "A," keeping it, then choosing an "M," not replacing it, and then choosing another "M"?
- d) What is the probability of choosing an "S" from this set of cards?
- e) What is the probability of choosing an "A" OR an "M" from this set of cards?



### Probability Detective

Adam is playing a game of Probability Detective. He is given the clues listed below:

- There are 8 marbles in a bag.
- The marbles are blue, red, or green.
- The number of blue marbles is the same as the number of red marbles.
- There are more red marbles than green marbles.

What is the probability of drawing a red marble and then a green marble from the bag without replacement? Justify your answer.

FOR TEACHER USE ONLY:

a. YES NO Student arrives at a correct solution?

	4	3	2	1
b. Conceptual Knowledge				
c. Procedural Knowledge				
d. Communication				



## Unit 10 Lesson 1

- 1 Raul tosses 3 fair coins. What is the probability that all 3 will land heads up?
- A  $\frac{1}{8}$
- B  $\frac{1}{6}$
- C  $\frac{1}{3}$
- D  $\frac{1}{2}$
- 2 A bag contains 5 blue marbles, 4 red marbles, and 1 green marble. What is the probability of drawing a blue marble, then another blue marble without replacement?
- A  $\frac{1}{2}$
- B  $\frac{5}{11}$
- C  $\frac{1}{4}$
- D  $\frac{2}{9}$
- 3 Susan can't find a coin to toss and needs to come up with another way to simulate this event. Which of the following could NOT be used to simulate the tossing of a fair coin one time?
- A A spinner is divided into 6 equal sized sections. Three of the sections are colored yellow and the other 3 are colored green.
- B A number cube is labeled so that 2 sides are numbered with a "1," 2 sides are numbered with a "2," and 2 sides are numbered with a "3."
- C A set of 20 cards is created where 10 cards are "hearts" and the other 10 cards are "diamonds."
- D Five blue cubes and 5 orange cubes are placed in a bag.
- 4 Marcus places 3 pink cubes, 2 green cubes, 1 yellow cube, 9 white cubes, and 5 blue cubes in a bag. What are the chances of pulling a green cube, not replacing it, and then pulling a blue cube from the bag?
- A  $\frac{7}{20}$
- B  $\frac{1}{10}$
- C  $\frac{1}{38}$
- D  $\frac{1}{40}$